

Listing of the Claims

This listing of claims replaces all the prior claim versions and listings:

- 1-18. (Cancelled)
19. (Previously presented) A sensing system for detecting and identifying a volatile compound in an air sample comprising:
- a) a nucleic acid/fluorophore based sensor array comprising a plurality of nucleic acids;
 - b) a fluorophore attached to said nucleic acids;
 - c) a plurality of fibrous or particulate substrates wherein said nucleic acids are attached to;
 - d) a substrate support;
 - e) an excitation light source array comprising a plurality of light sources optically coupled to said sensor elements;
 - f) a detector array comprising a plurality of detectors optically coupled to said sensor elements;
 - g) a sample chamber for housing said sensor elements, said light source array, said detector array;
 - h) a sampling means enclosed in said chamber for drawing said ambient air into said chamber for contact with said nucleic acid/fluorophore based sensor array for a controlled exposure time;
 - i) a controller means in electrical communication with said light sources, said detectors, and said sampling means, said controller means electrically coordinating and switching said sampling means with said light sources and said detectors for sampling said ambient air, measuring optical responses of said nucleic acid/fluorophore based sensor arrays to said ambient air sample, and detecting said volatile compound; and
 - j) an analyte identification algorithm for comparing said measured sensor optical responses to characteristic optical responses of said sensors to target analytes and identifying said analyte in said air sample.

20. (Previously presented) A sensing system for intelligent detecting and identifying an analyte in an air sample comprising:
- a) a nucleic acid/fluorophore based sensor array comprising a plurality of nucleic acids attached to a fluorophore wherein the nucleic acids attached to the fluorophore are attached to a fibrous or particulate substrate;
 - b) a detector array comprising a plurality of detectors in communication with said nucleic acid/fluorophore based sensor array;
 - c) a sampling chamber for housing said nucleic acid/fluorophore based sensor array and said detector array;
 - d) a sampling means enclosed in said chamber for drawing said ambient air into said chamber for contact with said nucleic acid/fluorophore based sensor array for a controlled exposure time;
 - e) a microcontroller in communication with said sampling means and said detector array, said controller means coordinating and switching said sampling means and said detector array for sampling said ambient air, measuring responses of said sensors to said air sample, detecting said analyte, and reporting an analyte detection result;
 - f) a sampling algorithm for directing said microcontroller; and
 - g) an analyte identification algorithm in communication with said sampling algorithm and said microcontroller, said identification algorithm comparing said measured sensor optical responses before and after exposure to the analyte to characteristic responses of said sensors to analytes and identifying said analyte in said air sample.
21. (Original) The sensing system of claim 20, wherein said identification algorithm comprises a response report comparing a spatio-temporal pattern of said measured optical responses to a spatio-temporal pattern of said characteristic responses; and an identification report selected from the group consisting of a pattern match, a delay line neural network match, and a neuronal network match.
22. (Original) The sensing system of claim 20, wherein the sensing system is attached to a shipping container.

23. (Original) The sensing system of claim 20, wherein the sensing system is attached to an x-ray screening machine.
24. (Original) The sensing system of claim 20, wherein the sensing system is remotely controllable.
25. (Original) The sensing system of claim 20, wherein the sensing system is incorporated into a hand-held device.
26. (Previously presented) A sensor array system for remote characterization of a gaseous or vapor, sample, comprising:
 - a) a plurality of sensors, wherein at least one sensor comprises nucleic acid/fluorophore combination comprising a plurality of nucleic acids attached to a fluorophore wherein the plurality of nucleic acids attached to a fluorophore are attached to a fibrous or particulate substrate, wherein the plurality of sensors provide a detectable signal when contacted by an analyte;
 - b) a measuring apparatus, in communication with plurality of sensors capable of measuring the detectable signal;
 - c) a transmitting device, in communication with the measuring apparatus for transmitting information corresponding to the detectable signal to a remote location via the Internet, fiber optic cable, and/or an air-wave frequency; and a computer comprising a resident algorithm capable of characterizing the analyte.
27. (Original) The sensor array system according to claim 23, wherein the sensor system comprises a plurality of measuring apparatuses.
28. (Previously presented) The sensing system of claim 19 or 20, wherein the substrate is a silk screen.
29. (Previously presented) The sensing system of claim 19 or 20, wherein the substrate is fiberglass.